

Integrated optics - Interfaces - Parameters relevant to coupling properties (ISO 14881:2021)

EESTI STANDARDI EESSÕNA

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English Version

Integrated optics - Interfaces - Parameters relevant to coupling properties (ISO 14881:2021)

Optique intégrée - Interfaces - Paramètres
caractérisant les propriétés de couplage (ISO
14881:2021)

Integrierte Optik - Schnittstellen - Kopplungsrelevante
Parameter (ISO 14881:2021)

This European Standard was approved by CEN on 9 October 2021.

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COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (EN ISO 14881:2021) has been prepared by Technical Committee ISO/TC 172 "Optics and photonics" in collaboration with Technical Committee CEN/TC 123 "Lasers and photonics" the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2022, and conflicting national standards shall be withdrawn at the latest by April 2022.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 14881:2005.

Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 14881:2021 has been approved by CEN as EN ISO 14881:2021 without any modification.

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 172 *Optics and photonics*, Subcommittee SC 9, *Laser and electro optical systems*. In collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 123, *Lasers and photonics*, in accordance with the agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 14881:2001), which has been technically revised. The main changes compared to the previous edition are as follows:

- Terminologies that have not been frequently used over the last 5 to 10 years are revised to those matching to current trends.
- In the revision process, terminologies and definitions are compared to similar terminology definitions in IEC and harmonized.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The aim of this document is to clarify the terms of the field of “integrated optics” and to define a unified vocabulary. It is expected that this document will be revised periodically to adopt the requirements of customers and suppliers of integrated optical products. At a later stage, it is planned to add definitions from other International Standards which deal with integrated optics.

Some of the definitions are closely related to definitions given in IEC 60050-731. Wherever this can lead to misunderstanding, integrated optics or integrated optical waveguide should be used together with the defined term.

Integrated optics — Interfaces — Parameters relevant to coupling properties

1 Scope

This document defines the relevant properties for coupling lightwaves into and out of integrated optical chips (IOC) and chips with photonic integrated circuits (PIC). This document mainly focuses on butt coupling via the waveguide endfaces. The definitions provide the basis for specifying the elements to be coupled (e. g. fibres, integrated optical chips) related to coupling properties.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4288, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Rules and procedures for the assessment of surface texture*

ISO 11807-1:2021, *Integrated optics — Vocabulary — Part 1: Basic terms and symbols*

ISO 11807-2, *Integrated optics — Vocabulary — Part 2: Terms used in classification*

IEC 60793-1-20, *Optical fibres — Part 1-20: Measurement methods and test procedures — Fibre geometry*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 11807-1 and ISO 11807-2 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

Note 1 to entry A list of relevant terms and symbols can be found in [Annex A](#).

3.1

adiabatic coupling

coupling of fibre and tapered waveguide or two waveguides one of which, at least is tapered to utilize mode coupling without optical power loss for maximum *coupling efficiency* ([3.9](#))

3.2

anti-reflective coating of endfaces

thin film coating on the endfaces of optical chips designed to reduce the *Fresnel loss* ([3.15](#))

3.3

array block

mechanical alignment structure of micrometre or submicrometre precision for the reception of optical fibres adopted in *single-fibre coupling* ([3.21](#)) and *fibre array coupling* ([3.12](#))

Note 1 to entry: The alignment structures, which are generally arranged in a regular pattern, determine the position of the fibres with respect to each other. These positions are defined by the fibre's cladding diameter and the geometry of the alignment structures.